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To His Honour
The Lieutenant Governor of the
Province of British Columbia

May It Please Your Honour:

Herewith I have the honour to submit the annual report of the Province of British Columbia Ministry of Environment for the period April 1, 1989 to March 31, 1990.

John Cashore
Minister of Environment

The Honourable John Cashore
Minister of Environment

Sir:

I have the honour to submit the annual report of the Province of British Columbia Ministry of Environment for the period ended March 31, 1990.

G.R. Armstrong
Deputy Minister
of Environment

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The Ministry

The Ministry of Environment is responsible for maintaining environmental quality through management and protection of the Province's land, water, air and living resources.

The Ministry's mission is threefold:

- *to encourage a sustainable environment;*
- *to curb environmental degradation; and*
- *to ensure that environmental management can meet the changing needs and priorities of the many users of the resources.*

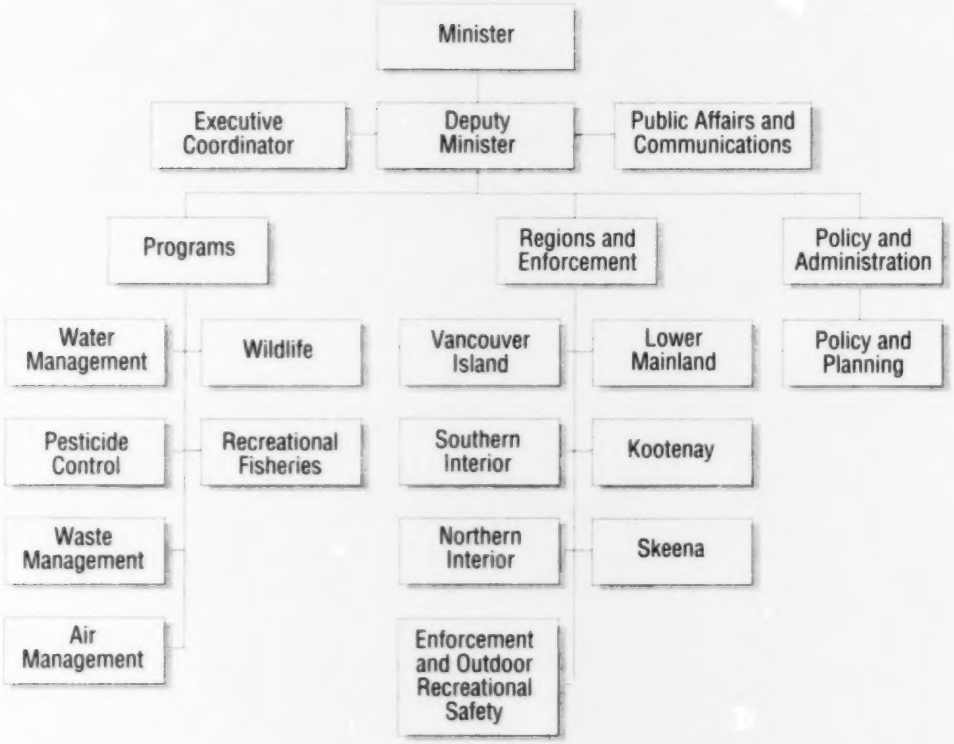
In conjunction with other ministries and agencies (public and private), the Ministry contributes to the government's commitment to the concept of sustainable development. In meeting this objective, the Ministry is committed to the following principles:

- *maintaining basic levels of environmental quality and public safety;*
- *focusing development so it does not impair future options for use of the environmen;, and*
- *generating economic benefits from environmental resources.*

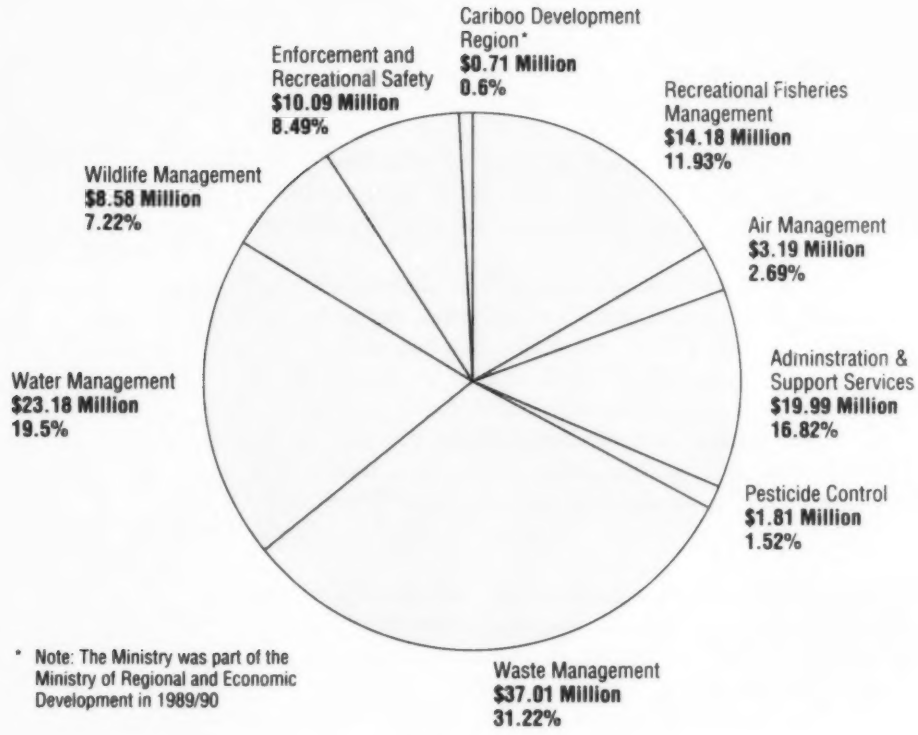
The Ministry pursues its mission through two primary functions: resource stewardship and regulatory action. Ministry staff charged with seeing this mission through represent many specialties and disciplines.

The following pages provide details of their work during the fiscal year that began April 1, 1989, and ended March 31, 1990.

B.C. Ministry of Environment
Lines of Responsibility



Ministry Budget, 1989/90



* Note: The Ministry was part of the Ministry of Regional and Economic Development in 1989/90

Total 1989/90 Estimate $118,831,651

The Year in Review

Public Concern

The environment in which the ministry operated during 1989/90 was fundamentally different from that of a decade before.

As the century draws to a close, the need for effective action on the environment has never been more urgent. As the report of the World Commission on Environment and Development (the Brundtland Report) makes clear, environmental factors can no longer be separated from economic decisions.

Both the general public and special interest groups have growing expectations regarding environmental quality, and are seeking more involvement in economic decision-making and conflict resolution. British Columbians are concerned about personal health and safety, and are demanding effective monitoring, regulations and enforcement, greater industry responsibility, and better information on environmental issues.

The most important trend in environmental issues is that they are rapidly becoming everybody's business. And the public expects government to take a leadership role, by clarifying responsibilities and motivating all sectors of society toward effective solutions.

Oil Spills

The year began with the issue of oil spills very much on the minds of British Columbians. The grounding of the tanker *Exxon Valdez* off the coast of Alaska, in March 1989, made clear just how devastating such an incident could be to the environment. Although the spill never reached British Columbia's shores, it raised questions about the risk of a similar incident in B.C. coastal waters, and the Province's ability to deal with it.

Earlier in the year, a spill from the oil barge *Nestucca* off the coast of Washington State prompted the appointment of the Washington State/B.C. Task Force on Oil Spills, in January 1989. Co-chaired by the Deputy Minister of Environment for B.C., the Task Force's first meeting was held on March 23, the very day of the *Exxon Valdez* disaster. British Columbia and Washington were subsequently joined by Alaska, Oregon and California, thus setting the stage for real progress in developing coordinated emergency response procedures. Additionally, a Special Advisor was appointed by the Premier to review the entire issue of oil tanker traffic along the B.C. coast.

Following extensive public consultation, the report of the Special Advisor was released on December 8, and was followed on December 20, by the interim report of the B.C./Western States Oil Spill Task Force. Both reports have since led to the development of prevention and preparedness programs, both within B.C. and jointly with other west coast jurisdictions.

Contaminated Soils

Among the province's many land-based issues was the redevelopment of the former home of Expo 86, following decades of heavy industrial use. In April, the Ministry of Environment took an important step by establishing soil classification standards for the Expo site. Public meetings were then held to flesh out a plan to deal with contaminated soils and groundwater at the site's east end. As the year came to a close, government and industry were well on the way to finding productive solutions to this complex problem.

Fraser Valley Air Quality

Another Lower Mainland issue was that of air pollution in the Fraser Valley, primarily from automobile exhaust. In May, a task force representing the Ministry of Environment, the Ministry of Solicitor General, Environment Canada and the Greater Vancouver Regional District recommended compulsory emission

control testing for all motor vehicles in area. Details of the testing program were being developed by provincial and GVRD staff at year's end.

A New Program for Youth

The spring of 1989 saw the formation of the Environment Youth Corps, a joint initiative between the ministries of Environment and Social Services and Housing, designed to provide employment and training for young people from 16 to 24 years of age. Youth Corps crews are employed in environmental projects, including emergency response and education programs, in communities around the province.

Industrial Pollution

An ongoing concern throughout the year was that of organochlorine discharges from B.C. pulp mills. The urgency of the issue had intensified in November 1988, when the federal government closed three shellfish harvesting areas adjacent to coastal pulp mills because of high dioxin levels. Details of a forthcoming pulp mill effluent discharge regulation were announced in May 1989, to be implemented following extensive discussions with industry.

New controls were announced at the end of August, placing limits on wood treatment chemicals employed by the lumber industry. The restrictions applied to concentrations of chlorophenols and other anti-sapstain chemicals in water running off from lumber storage areas during rainstorms. The first phase of the new regulation came into effect in November 1989, while a tougher second phase was planned for September 1990.

Enforcement

During the year, the Ministry's enforcement capability was strengthened through the formation of Environmental Enforcement Units within each region,

specializing in waste and pesticide investigations. As Ministry enforcement operations were strengthened, so too were penalties under the Waste Management Act. In order to reflect the cost of environmental damage more realistically, maximum fines for major polluters were increased to $1 million, and to $3 million and/or a three-year prison sentence for incidents involving wanton disregard for public safety.

Municipal Solid Waste

In June, a comprehensive report was released on the management of municipal solid waste, following extensive consultation with local government, industry and the public. The report of the Task Force on Municipal Solid Waste Management made over 70 recommendations for reducing the flow of solid waste into landfills. These recommendations in turn formed the basis of a comprehensive strategy, announced by the Minister in September, aimed at reducing the flow of garbage to landfills by one-half by the year 2000.

Other Highlights

Other major initiatives of the Ministry included:

- $3 million in B.C. Lottery funds dedicated to joint research projects of the provincial and federal governments, the University of British Columbia and the industries involved, aimed at dealing with acid mine drainage and forest industry wastewater;

- a five-year, $6 million extension to the Pacific Estuary Conservation Program to purchase coastal wetlands and fund fish and wildlife habitat enhancement;

- an additional $1 million per year allocated for the Habitat Conservation Fund to enhance its capacity to finance worthwhile conservation initiatives; and

- the enormous success of the Globe 90 Environmental Conference and Trade Show held in March at B.C. Place and the Vancouver Trade and Convention Centre, which prompted the Ministry to provide financial support for a permanent Globe office on the lower mainland.

Environment/Economy Measures

In addition to programs and initiatives implemented by the Ministry of Environment, two significant steps were taken during 1989/90 toward the harmonization of environmental and economic decision-making in B.C.

In June 1989, the ***Task Force on Environment and Economy*** *presented its report to the Ministers of Environment and Regional Development, and in January 1990, the* ***B.C. Round Table on Environment and Economy*** *was appointed.*

The Round Table is a permanent body with membership drawn from many parts of society, including business, government, labour, environmental and native groups, and the universities. It works closely with the Ministry of Environment and other government and non-government organizations to discharge its mandate of developing a sustainable development strategy for British Columbia.

Chronology

1989

April 10

Alaska and Oregon join the States/B.C. Task Force on Oil Spills.

April 17

Provincial standards are announced for cleanup of contaminated soils at the Pacific Place site in Vancouver.

May 1

An inter-agency task force report recommends compulsory inspection of motor vehicles in the Lower Mainland to control air pollution.

May 1

A new regulation is announced to control environmental impacts from placer mining operations.

May 2

David Anderson appointed as Special Advisor to the Premier on Oil Spills and Tanker Traffic.

May 5

Environment Youth Corps launched, to provide environment-related employment and training for young people aged 16-24.

May 12

A schedule of strict controls on chlorinated organic compounds discharged from pulp mills is announced.

June 6

Construction of a new $5 million trout hatchery at Duncan on Vancouver Island is confirmed.

June 8

The Task Force on Municipal Solid Waste Management makes more than 70 recommendations for reducing the amount of garbage generated in B.C.

June 19

The Task Force on Environment and Economy releases its report, *Sustaining the Living Land.*

July 14

Provincial inventory of 450 PCB storage sites released.

July 18

A joint report by the ministries of Health and Environment recommends a comprehensive strategy for managing biomedical wastes.

July 27

The federal and B.C. Environment ministers sign a ten-year agreement for cooperative management of wildlife.

August 4

Clayoquot Sound Sustainable Development Task Force appointed.

August 30

Provincial regulations to control chlorophenols and other wood treatment chemicals announced.

September 19

Five-year provincial municipal solid waste strategy launched at the Union of B.C. Municipalities annual convention.

November 29

A joint federal/provincial/municipal action plan to address pollution in Burrard Inlet is initiated.

December 7

Pacific Estuary Conservation Program extended for five years.

December 8

Anderson Report on oil spills and tanker traffic released.

December 11

Joint conservation strategy for grizzly bears announced by B.C., Washington, Idaho, Montana and the U.S. federal government.

December 20

Interim report of the States/B.C. Oil Spill Task Force released.

1990

January 16

B.C. Round Table on Environment and Economy appointed.

February 19

Major Project Review Process announced.

March 18–23

Globe '90 conference and trade fair held in Vancouver.

Waste Management Program

Goal:
To protect the environment by regulating waste discharges and controlling the impact of polluting substances generated by all sources, from major industries to individuals.

Activities:

- *developing discharge and emissions standards;*
- *working with the Air and Water Management Programs to establish environmental quality objectives, develop strategies ensuring attainment of the objectives, and monitor the environment to see that the objectives are maintained;*
- *minimizing the introduction of hazardous substances into the environment; and*
- *protecting the environment by managing discharges to air, land and water.*

Program Highlights

Waste Management responsibilities continued to grow this year in response to new economic realities and increased demand for environmental protection. Technological advances in the detection and measurement of contaminants, and the logistical difficulties associated with controlling increasing quantities of waste products, have also led to a variety of new initiatives.

A key development during 1989/90 was the reorganization of Waste Management headquarters

staff into a new Environmental Protection Division, composed of four branches. This move has already improved the Ministry's efficiency in handling waste management issues and instigating legislative and regulatory changes.

The penalty provisions under Section 34 of the *Waste Management Act* were amended to more realistically reflect the cost of environmental damage caused by major polluters. Maximum fines of up to $1 million were introduced, and the courts were given latitude to:

- levy fines commensurate with the monetary benefits of infractions; and
- impose up to a $3 million fine and/or a three-year prison sentence for incidents of wanton disregard for public safety.

A number of new regulations were implemented over the year. Among them was the Antisapstain Chemical Waste Control Regulation, introduced to control releases of antisapstain chemicals to land, water and air from wood treatment facilities and lumber storage areas.

A new Placer Mining Waste Control Regulation exempts placer mining operations from having to obtain permits as long as they meet certain conditions, such as not using chemicals.

A new regulation was activated limiting the sulphur content of industrial fuels used in British Columbia, including high-sulphur heavy fuel oil used in pulp mills, to 1.1 per cent. The regulation, which is expected to contribute significantly to the reduction of acid rain levels on the south coast, was amended to establish a deadline for specific mills on Vancouver Island to meet new limits by connecting with the Vancouver Island Natural Gas Pipeline. Natural gas has a much lower sulphur content than heavy fuel oil.

Groundwork was also laid for a regulation to control the amounts of chlorinated organic compounds in pulp mill effluent entering the environment. By year-end, negotiations with industry concerning regulation details were underway.

In May 1989, the Special Waste Regulation was amended to define management practices for historical special waste contaminated sites.

The Toxicology Unit was instrumental in preparing the Report of the British Columbia Task Force on Biomedical Waste, which was released during the year. It was also involved in creating a provincial biomedical waste system planning committee, and amending the Waste Management Act to allow for biomedical waste controls. This unit was also responsible for the publication of B.C. standards for managing contaminants at the old Expo site on the Lower Mainland, instigation of early registration for less toxic antisapstain chemicals, and development of the phase II dioxin strategy.

A review of contaminated sites legislation in other jurisdictions was completed by Contaminated Sites Unit staff, along with recommendations on what should be covered in British Columbia's regulations. Further to this, a comprehensive draft of contaminated sites legislation for our province was prepared in the form of an amendment to the Waste Management Act.

The Municipal Solid Waste Management Task Force Report was released in the spring. Since that time, most of the recommendations contained therein have been incorporated as part of the Ministry's overall strategy in this area.

In August, the Waste Management Act was amended to require every regional district in the province (including municipalities) to submit a Waste Management Plan by December 31, 1995. The amendment also called for regional districts to have biomedical waste management plans by December 31, 1992.

In response to the requirement for biomedical waste management plans, it was determined that a more cost-effective and environmentally acceptable solution could be developed through implementation of a joint provincial government/Greater Vancouver Regional District strategy. This decision led to the formation of a Biomedical Waste System Planning Committee in October 1989. At year-end, the committee was in the

process of preparing a call for proposals to the private sector for collection, treatment and disposal of the 15 to 20 tonnes of biomedical waste generated every day in British Columbia.

Program Activities

Waste Management Permits

In 1989/90, there were 159 permits issued, 235 amendments to existing permits, and 124 approvals granted.

Special Wastes and Emergencies

During the year, over 600 new special waste generator registrations, nearly 500 licences to transport special wastes, over 10,000 shipping manifests, and several dozen international shipment prenotifications were processed.

The Ministry's eight regional special waste storage operations collected some 200 barrels of sorted hazardous wastes and shipped them to the appropriate disposal facilities.

Program personnel also arranged for disposal of reactive chemical wastes with the RCMP, and responded to most of the nearly 2000 spills reported during the year.

Contaminated Sites

Technical site investigation reviews were conducted on over 100 potential contaminated sites around the province. Other activities included:

- advising regional Ministry staff and municipal officials on site investigation and procedures;

- processing approvals for special waste contaminated soils related to petroleum hydrocarbon contamination;
- contracting investigations of contaminated mine tailings at Wells;
- participating in the development of the National Contaminated Sites Cleanup Program; and
- presenting seminar and workshop papers to a number of organizations on the B.C. Contaminated Sites Program.

Air Management Program

Goal:
To protect human health and the environment, by maintaining the quality of British Columbia's atmosphere.

Activities:

- *developing and implementing airshed management policies to prevent air quality erosion;*
- *developing regulations and criteria for air contaminant emissions from various sources.*
- *monitoring air quality in the major airsheds of the province and establishing standards;*
- *providing atmospheric data and the services of air quality experts to programs in the Ministry and other government agencies and the public; and*

Program Highlights

Urban air quality problems caused by industry, motor vehicle exhaust and other sources continued to challenge the Ministry during 1989/90. In response, the Ministry continued to work closely with the GVRD in managing air emissions in the Lower Fraser Valley.

The Ministry participated in the development of a national strategy, and the drafting of possible provincial regulations, to control gases such as CFCs and Halons that damage stratospheric ozone.

Acid rain monitoring continued throughout the province. The Strait of Georgia received special attention due to the severity of acidic deposition in that area. In addition, Air Management staff met with American officials from federal and Washington State agencies to discuss the environmental impact of acidic deposition in the Pacific Northwest.

At a number of locations including Trail, Kimberley, Port Alice, Powell River, Skookumchuk and Howe Sound, vegetation was monitored for evidence of injury due to air pollutants such as sulphur dioxide, hydrogen sulphide, mercury, lead and fluorides. In the Vancouver area, vegetation monitoring was also conducted to determine the impact of the new incinerator in Burnaby.

Special monitoring programs were carried out in the following locations:

- at Prince George, where a joint Ministry/industry project continued to monitor and assess local concentrations of total reduced sulphur;
- in Cranbrook to assist in the management of residential woodsmoke; and
- around the Strait of Georgia, where acid rain and fog was monitored and acidic deposition rates assessed.

New monitoring initiatives included the development of real-time data collection from air quality stations, and the beginning of a three-year upgrading of air quality monitoring instrumentation to increase the Ministry's ability to address air quality monitoring needs.

Program Activities

Monitoring

The Ministry maintains a computerized database of provincial air quality, meteorological and climatological

data to provide data and reports to both public and private agencies. To support this system:

- meteorological data was collected from 18 meteorological stations;
- climatological data was collected from 54 stations; and
- air quality data was collected from 33 stations operated by the Ministry, 60 by the Greater Vancouver Regional District, and 38 by industry.

Other Activities

A variety of other work was completed in 1989/90:

- the point sources emission inventory for 1985, with appendices for five regions;
- the Task Force Report on the Motor Vehicle Inspection and Maintenance Program implementation in the Lower Mainland (The drafting of a request for proposals for design, construction and operation of the program was initiated in March 1990.);
- interim emission objectives for woodwaste power boilers and gas turbines;
- draft background technical information document and final draft emission objectives for municipal solid waste incinerators; and
- the background technical information document for the development of emissions objectives for industrial boilers.

Energy Project Reviews

Reviews with a major air quality component included Northwest Energy (Williams Lake), Fording Coal (Elkford), Celgar (Castlegar) and Howe Sound Pulp and Paper (Port Mellon).

Water Management Program

Goal:
To manage provincial water resources for the social and economic development and well-being of all British Columbians.

Activities:
- *inventory of the water resource;*
- *management of supply and use;*
- *water quality management; and*
- *flood damage reduction.*

Program Highlights

This year, the Water Management Branch continued a major program to computerize licence records in British Columbia. By March 31, 1990, a hierarchical data base for water sources had been created containing about 23,000 streams and over 3,500 water reserves, restrictions and other notations.

Ministry inspectors found that some dams fell short of current design standards, particularly with respect to earthquake or major flood resistance. Such was the case at the Jordan River Dam where extensive rehabilitation work was completed in early 1990. In addition, inspection revealed erosion damage in the Greystoke Dam outlet works, which was subsequently repaired by the owner.

Studies at several supply dams belonging to the Greater Victoria and Greater Vancouver Water Districts revealed a need for remedial work. There was also continued monitoring of the landslide risk at Wahleach in the Fraser Valley. This risk, caused by a ruptured power tunnel, will be alleviated by building a new tunnel in sound rock.

Water Management Program

Increased funding was made available for management of Eurasian water milfoil, aquatic weeds which interfere with recreational water use and fisheries interests. In 1989/90, the Province contributed about $550,000 for milfoil control operations in 16 lakes. This funding amounted to 75 per cent of the total cost, with local municipalities covering the remainder. These operations included harvesting, rototilling, cultivating, dredging, bottom barrier techniques and manual control using SCUBA divers.

Program staff participated in Provincial Emergency Program flood response and assisted with post-flood restoration costing $521,000.

Program Activities

Inventory

To measure streamflow and water levels, the ministry operates a system of 582 hydrometric stations around the province under a standing federal/provincial agreement. Snow surveys, which indicate the potential for flood or drought, are also undertaken at strategic points both during and before the snowmelt period. The results are made available through Snow Survey Bulletins. During 1989/90, 1,249 manual snow surveys were conducted at 262 stations, and 19 automated stations were utilized.

Groundwater monitoring was also extensive. In 1989/90, 2,233 water well records were collected from well-drilling contractors, and 1,910 such records were processed. Water level fluctuations were monitored regularly at 145 observation wells across the province.

Ministry staff responded to 3,087 groundwater related for the year, and completed 14 assessments were completed in cases involving groundwater supply potential and use conflicts, and seven well capacity reviews for municipal water supplies.

Water Licensing and Water Utility Regulation

As of March 31, 1990, there were 39,227 active water licences in British Columbia. Over the year, 1,027 licences were granted and 793 licences were abandoned, cancelled or replaced, resulting in a net gain of 234.

Regional offices adjudicated 1,333 applications for approval under Section 7 of the Water Act, while the Comptroller of Water Rights heard six appeals from orders of engineers and 10 appeals from licencing decisions of Regional Water Managers. Also, 11 appeals of decisions of the Comptroller were heard by the Environmental Appeal Board.

A privately owned water system designed to service the public for money must be authorized through a Certificate of Public Convenience and Necessity issued by the Comptroller of Water Rights. In 1989/90, 48 applications for new or amended certificates were received. A total of 44 new or amended certificates were issued during the year.

Monitoring Hydroelectric Development and Reservoir Management

Ministry staff continued their involvement in monitoring of Columbia River Treaty reservoirs. A review of the Nechako Reservoir inflow flood was undertaken in conjunction with approvals for the Kemano Completion Project.

In addition, the Ministry worked closely with B.C. Hydro and the Alberta government to reduce the threat of flooding in the town of Peace River, resulting from water releases at Peace River dams during winter ice build-up and spring ice break-up.

Operating procedures at the Bridge River and Nechako Reservoirs were monitored with a view to alleviating a possible flood threat on the Fraser River caused by high watershed snowpack measurements.

Water Management Program

Dam Safety

The Provincial Dam Safety Program, which covers more than 2,000 storage and diversion works in the Province, conducted 72 regular and follow-up inspections at major dams, while regional staff inspected 312 minor dams. Underwater inspections by staff divers were completed at 31 installations.

Water Supply and Drainage

Under a federal/provincial agreement (ARDSA), financial assistance has long been available to producer groups for off-farm improvements. The Water Management Branch provides technical help to projects funded under this program, which is administered by the Ministry of Agriculture and Fisheries.

This year, Branch participation included completion of three feasibility studies on possible drainage improvement projects and one possible irrigation water supply project. These had estimated capital costs of just over $2.1 million and $305,000 respectively. Ministry personnel also provided project management on the construction of eight drainage projects valued at $9.5 million and 10 irrigation projects valued at $4.4 million.

Regulation of the Okanagan Main Stem and Nicola Lake Dam

Although the total inflow to Okanagan Lake was a little below average this year, there was sufficient water to fill the lake and, with careful management, accommodate all downstream users — irrigation, domestic, recreation and fisheries. The lake ended the year at very close to its ideal level.

The inflow to Nicola Lake in 1989/90, was three times greater than in the previous year but still lower than average. There was sufficient inflow to fill the lake at the beginning of the summer and provide all users with

ample amounts of water during the remainder of the year.

Monitoring Surface and Ground Water Quality

In 1989/90 criteria were issued for three contaminants, bringing th etotal to 12. Criteria are safe concentrations in water for various types of human and natural exposure.

Comprehensive monitoring to check on attainment of water quality objectives went on as usual this year. In addition, the results of similar monitoring conducted in 1988 were compiled and released.

The Canada/British Columbia Water Quality Monitoring Agreement provided cost-shared monitoring at 95 stations throughout British Columbia to determine long-term trends. Reports on trends will not be available until after at least five years of monitoring.

Over and above this activity, six lakes in the Lower Mainland and Southern Vancouver Island were monitored for the effects of acid precipitation.

The Groundwater Monitoring Program researched and contributed to 10 environmental assessment studies for major developments and produced 19 groundwater protection studies associated with natural phenomena, waste disposal, and accidental spills.

In addition, sampling was carried out at 84 wells in the Langley-Abbotsford, Grand Forks, Osoyoos and Cowichan Estuary areas, with six reports completed by year-end.

Aquaculture

The effects of net-pen aquaculture on marine water quality were investigated in Sechelt Inlet and other locations. A major contract was completed for investigation of the benthic effects of fish farms.

Public Health Engineering

The Program's Public Health Engineers, acting on behalf of both the Ministry of Environment and the Ministry of Health, are called upon to approve plans for waterworks systems with two or more connections, for public swimming pools, and for prefabricated septic tanks and package sewage treatment systems. In 1989/90, certificates were issued for 540 waterworks, 180 swimming pools and four septic tanks.

Public Health Engineers also provided 472 consultations this year to local medical health officers and regional health inspectors.

Floodplain Mapping and Planning

The mapping of flood-prone areas is carried out under the cost-shared federal/provincial Floodplain Mapping Program Agreement.

In 1989/90, program activities occurred in 21 areas of the province. Floodplain designations for six projects were completed, bringing the total number of designated or interim-designated floodplain areas to 50.

Special investigations were conducted on coastal, landslide and flood problems throughout the province. A larger study was undertaken in 1989/90, on proposed floodplain controls at Chilliwack.

The Water Management Program is extensively involved in determining areas that are prone to flooding and in assisting local governments with the development of land use plans and zoning regulations that take the flood hazard into consideration.

In 1989/90, the Program reviewed 1,744 local government regulations and 1,387 proposed subdivisions for flood prone land. The Program assisted local government with the adoption of four zoning bylaws respecting development in the floodplain.

Dyking Program

Many requests for assistance were received by the Ministry for channel clearing and river protection projects. Some 20 projects were completed at a cost of $245,000, with local landowners and municipalities contributing 25 per cent.

The Fraser River Flood Control Program, carried out under a federal/provincial cost-share agreement, spent $5 million on dyke protection initiatives in the Lower Fraser Valley. Related projects continued throughout the year at Coquitlam River, Glen Valley, Delta and Chilliwack, while the Pitt Meadows project was seen through to completion. Total expenditure in this area since 1968 has been $139.5 million.

Vedder River Floodway

The Vedder River Management Committee is responsible for administering the area between the flood control dykes. Its activities this year included a comparison of cross-section surveys in the reach encompassing the railway bridge, which indicated that considerable gravel deposition had occurred during the November and December floods. At year-end, removal options for the summer "fisheries window" were being considered.

Runoff Forecasting

In 1989/90, near normal snowpack and moderate snowmelt conditions resulted in subnormal peak flows and no flood damage. The flood warning system for the Squamish River was activated in the fall of 1989, with two storms causing some concern. They were carefully monitored but river levels, although very high, stayed within the dykes and little damage was reported.

Dyke Inspection

Inspections were carried out on 497 kilometres of dykes,

and 84 requests for changes to dykes were investigated. Staff were also involved in preparing flood damage estimates and supervising flood restoration work in Hope, Mission and Maple Ridge.

Fisheries Program

Goal:

To manage freshwater fish, fish habitat and sport fishing in British Columbia, to conserve wild fish stocks, improve sport fish populations and protect and improve habitat for both fish and anglers.

Activities:

Fish management involves licencing anglers, developing new methodology, assessing harvests, monitoring fish populations and stocking fish.

Habitat management takes the form of inventory, habitat protection and habitat improvement.

The Fisheries Branch supports the Program by providing policy, planning, coordination, evaluation and operation of intensive fish culture systems and specialized services to regions. Like the Wildlife Program, Fisheries is delivered in the field by the regional Fish and Wildlife offices.

Program Highlights

British Columbia has always been famous for its fishing opportunities in wilderness settings. However, recent increases in both angling and guiding for resident game fish in many rivers of the province have become a major concern for fisheries managers. Where angling guides

and resident anglers once coexisted amicably, increased competition for space and fish have led to friction between the two groups. There existed a danger that the overall angling experience could deteriorate, particularly in certain coastal rivers.

To solve the problem, a new approach to angler and angling guide management was developed, publicly discussed and adjusted for proposed implementation in 1990/91. The policy has four purposes:

- to maintain the number of uncrowded, quality opportunities to angle for large, wild fish in wilderness settings;
- to ensure that resident anglers continue to have access to high quality fishing opportunities;
- to develop a better management system for angling guides; and
- to develop and test systems for managing angler use.

This ambitious and complicated undertaking will continue to evolve in the years to come. Such an approach toward maintaining quality angling is unique among most North American jurisdictions.

As in previous years, trout, char and kokanee were reared at provincial government hatcheries in Duncan, Abbotsford, Summerland, Cache Creek and Wardner, as well as at several contract facilities. These 13 million fish were used to stock lakes and streams all over British Columbia.

Fish stocking to support recreational fisheries took place this spring in some of the farthest reaches of British Columbia. Ponds and lakes were stocked along the Alaska Highway north of Fort St. John, and two lakes were stocked in the northwestern-most corner of the province just below the Yukon border.

Concern arose during the year when Viral Haemorrhagic Septicemia (VHS), a condition known for its devastating effects on rainbow trout stocks in Europe, was isolated at two hatcheries in northwestern Washington State. Up until this point, no cases of VHS had ever been found in North America. Careful monitoring of trout stocks at Vancouver Island and

Fraser Valley hatcheries was undertaken, with no signs of the disease as of year-end.

In support of Vancouver Island's freshwater fisheries needs, property was purchased in Duncan for a new trout hatchery to replace an existing temporary facility. This year's major focus was on designing the hatchery and a suitable treatment system for its waste water.

Program Activities

Regulations and Licensing

In the 1989/90 sportfishing season, there were over 6,000 more resident angling licences sold than in the previous year, bringing the total up to 314,050. There was also a slight increase in licence sales to Canadians from other provinces, and a slight decrease in non-Canadian sales. In addition, there were about 1,500 fewer steelhead fishing licences sold and small increases in sales of Dean River Limited Entry and Kootenay Lake rainbow trout licences.

There was a 12 per cent increase in Chinook Conservation Stamp purchases over the previous year. These stamps, allowing anglers to take salmon from freshwater, are part of a federal/provincial commitment to create benefits from a joint Salmonid Enhancement Program which was launched in 1975.

Survey information indicates that almost 100,000 juveniles, who are not required to buy angling licences, also fished over the period covered in this report.

A limited number of non-tidal commercial and domestic fishing licences (30) were issued in 1989/90, including classes of licences for game fish, coarse (non-game) fish and crayfish. An estimated 20 per cent of licencees did not fish and 10 per cent fished unsuccessfully. The overall catch of nearly 5,700 kilograms, dominated by carp and other minnows, is considered to be quite low in relation to the number of licences issued.

Private fish pond permits, issued principally for rainbow trout, range from 400 to 600 annually. These permits allow culture of fish for personal and non-commercial hobby purposes, and are usually issued for Vancouver Island, Omineca-Peace and Lower Mainland regions. There were also about 30 live fish permits issued this year for research, holding and display purposes. Permit holders in this category include universities, colleges, private bioassay laboratories, public aquaria, fish markets, restaurants and sport or mall shows.

As usual, movement of fish into and within the province was monitored for disease and genetic implications by a federal/provincial transplant committee. There were 312 transplant applications reviewed this year, bringing the total number since 1977, to nearly 4,000.

Habitat Protection

Staff reviewed over 23,000 projects with potential impact on fish habitat. About 50 percent of these projects were related to forestry. In addition, 503 pesticide permit applications were processed, most of them also forestry-related.

A computerized approach to logging and tracking habitat referrals came into widespread use in 1989/90. This system may eventually become an important database for a new Geographic Information System.

The Forest Resource Development Program, administered through a joint Ministry of Forests/ Ministry of Environment committee, made significant progress in streamlining its operations this year. The total budget allocated between all regions and Headquarters was $440,000.

Inadequate minimum instream flows for fish continued to be a major concern in 1989/90. At year-end, efforts were continuing to develop procedures and methods of identifying and protecting minimum flow conditions.

Habitat Assessment

The Habitat Assessment Unit coordinates fish and fish habitat inventory throughout the province. It develops and tests methods and standards, trains staff in inventory procedures, provides professional expertise in the assessment of development impacts on fish habitat, and develops and manages fisheries information and mapping systems.

The Unit's major achievement of the year was the near completion of a provincial 1:50,000 scale digital stream atlas which can be used for analysis and display of aquatic data.

A Stream Survey Manual and a revised compilation of Limnological and Fisheries Surveys of Lakes in British Columbia were in final review at the close of the year. In connection with these projects, 10 lakes were inventoried and assistance was provided to regional staff for the completion of more than 30 other surveys and impact studies.

There was continued staff involvement in the Fish/ Forestry Interaction Program on the Queen Charlotte Islands, along with increased participation in the Carnation Creek Experimental Watershed Project. It should be noted that the Carnation Project, launched in 1970, has achieved international recognition for its contributions to our understanding of timber harvesting impacts on stream environments and fish.

Fisheries Assessment and Improvement

The Fisheries Assessment and Improvement Unit coordinates fisheries assessment and enhancement throughout the province. In addition to other duties, it conducts stock assessments and project monitoring, and provides technical advice to regions.

In 1989/90, the unit coordinated the development and implementation of the Small Lakes Information System. This system measures angler effort through aerial boat counts and provides a standard analysis of

over 400 lakes in the central, southern and south-eastern interior regions of the province.

Other projects included:

- continued assessment and monitoring of juvenile steelhead stocks in major steelhead rivers in the Vancouver Island, Lower Mainland, Thompson-Nicola and Skeena regions;
- completion of a major report examining the impacts of highway construction on Coquihalla River steelhead; and
- estimation of kokanee population abundance in Kootenay, Arrow and Okanagan lakes, using echo-sounding techniques.

Fish Culture

In 1989, provincial government facilities released 11 million fish (91,400 kilograms). There were also 1.6 million steelhead and anadromous cutthroat (57,750 kilograms) released from contract, federal and public involvement hatcheries under the guidance of Fish Culture staff.

About 14.8 million eggs were collected this year from a variety of wild fish stocks, for the provincial Fish Culture Program. This practice allows program personnel to match certain kinds of fish stock to certain kinds of lakes and streams.

In the past, the main source of kokanee brood stock has been the Meadow Creek spawning channel on Kootenay Lake. This year, the Meadow Creek run did not produce any surplus fish because of declining productivity at Kootenay Lake, so eggs could not be taken. Fortunately, facilities were completed over the summer at Hill Creek on Arrow Lake and a strong kokanee spawning run was returned to that system.

Kokanee eggs were also collected at Mission Creek. These were cultured (under contract) at Skaha Hatchery for release into Okanagan Lake to improve the sport fishery.

The search for new and special brood stocks continued this year. Among the newest of these to be cultured was the Blackwater River rainbow trout, a stream resident stock which adapts well to lakes. Because it feeds on fish, it is more competitive than other trout stocks and will be added to lakes containing coarse fish species. It is hoped that stocking a trout that successfully competes with coarse fish will reduce the need for expensive treatment of lakes with rotenone.

Information systems are becoming an integral part of the Fish Culture Program. This year, a release records database became fully operational, making it easier to access information on fish releases from the early 1900s to present. Work is now underway to develop a new hatchery data management program to keep track of fish as they are reared in hatcheries.

Wildlife Program

Goal:
To administer the province's wildlife resources for the benefit and enjoyment of all British Columbians. This goal is achieved by maintaining a balance between ecological, cultural, economic and recreational needs.

Activities:

- *maintaining and enhancing wildlife and wildlife habitats to ensure an abundant, diverse and self-sustaining wildlife resource throughout British Columbia;*
- *maintaining, enhancing and promoting opportunities to appreciate, study and view wild species in their habitats;*
- *maintaining, enhancing and promoting recreational opportunities to hunt game species in their habitats;*
- *facilitating commercial uses of wildlife; and*
- *protecting people and property against intolerable levels of danger, damage or harassment from wildlife.*

Program Highlights

1989/90 saw continued public demand that government take a broadened role in managing non-game wildlife and non-consumptive uses of wildlife.

New initiatives in this area included the startup of the

Wildlife Viewing Program in cooperation with several other government and non-profit agencies, cooperative research on several non-game species with the Royal British Columbia Museum, recovery plans for several threatened and endangered species, and biodiversity studies carried out cooperatively with the Ministry of Forests.

The more traditional activities of the Wildlife Program, such as the management of wildlife for hunting, guiding, and trapping, also retained their importance.

Reflecting the increased attention being given to trans-boundary environmental concerns in general, a conservation strategy agreement was signed in November 1989, for grizzly bears that are shared between British Columbia, Montana, Idaho, and Washington.

One of the oldest uses of game animals was re-examined this year, as Wildlife staff and Conservation Officers throughout the province were surveyed to determine the costs, use and general status of the sustenance hunting program.

Program Activities

Wildlife Viewing Program

This program was launched officially on April 1, 1989, with a five-year budget of $1.7 million. Funds were allocated for a marketing strategy, regional viewing plans, viewing area development plans, an information program, and other activities. Program partners included the Ministries of Parks, Forestry, and Tourism, the Canadian Wildlife Service and the Pacific Estuary Fund. The first survey in a five-year series was conducted to determine the level of provincial residents' participation in wildlife viewing and their perceptions of the viewing program.

Wildlife Program

Non-Game Wildlife

Growing commitment to non-game species was reflected in an agreement with the Royal British Columbia Museum for cooperative research into the occurrence, range and habitats of small mammals, reptiles and amphibians in the province. The night snake, tailed frog, Townsend's mole, and the marsh shrew were among the animals researched during the year. National recovery teams were also established for the spotted owl and endangered Vancouver Island marmot. A recovery plan was drafted for the marmot, and a provincial recovery team appointed for the burrowing owl.

In addition, a cost sharing arrangement with the Ministry of Forests enabled the Branch to study the effects of forest management on small mammals and reptiles in the Queen Charlotte Islands and two Greater Vancouver watersheds. Tentatively, the greatest diversity of animal species has been found in young second growth forest.

Wildlife Habitat

In October 1989, a public information paper outlining the designation of Wildlife Management Areas was released.

Wildlife habitat descriptions and tables of representative wildlife species were completed for each of the 14 provincial bioclimatic zones, at the request of the Ministry of Forests.

Habitat Conservation Fund

In 1989/90, the Habitat Conservation Fund approved funding for 126 fisheries and wildlife enhancement projects. In addition, 17 individuals and organizations received grants totalling almost $40,000 from the Public Conservation Assistance Fund, to help them carry out conservation projects.

Legislation was amended to allow revenue derived from land administered by the Ministry of Environment to be paid into the Habitat Conservation Fund, rather than going into general revenue.

Negotiations for the $2 million acquisition of several parcels of wildlife habitat were launched following approval of expenditure from the Crown Land Account.

Wildlife Management

Early in 1990, a pilot project was launched on six provincial ranches to study the ability of special breeds of guardian dogs to protect domestic livestock from predators.

An analysis of ungulate population inventory needs was completed during the year.

Game farming continued to increase in popularity with entrepreneurs. At year end there were 32 fallow deer, sixteen bison and four reindeer farms in the province, with 6,300, 1,500 and 300 head of livestock respectively.

A first-time telephone survey of mule deer hunters was conducted to give early regional indications of hunter effort and mule deer harvest. Survey results were available in late January. Final results of the regular mailed Hunter Sample Survey became available in May.

The Biometrics section produced a special survey form to be completed during compulsory inspections of harvested game animals to provide information on hunter use of packers.

Authorizations for Limited Entry Hunts increased by 21 percent over 1988. Applications increased nearly 8 percent, continuing a trend followed from the inception of LEH in 1974.

The provincial review of grizzly bear harvest management was completed, and a review of black bear management was initiated.

Detailed management guidelines for fisher were published in one of a series of guideline booklets prepared for trappers.

Education Programs

The provincial trapper education program was expanded to include courses for licenced trappers and a program of native trapper education.

A new manual for the Conservation and Outdoor Recreation Education Program was made available. CORE graduates for 1989/90 numbered 6,014, a 70 percent increase over the previous year.

Pesticide Control Program

Goal:

To ensure that only federally approved pesticides are used in the province and that they are handled safely, with minimal risk to the environment.

Activities:

- *developing legislation, to establish a basis for regulating all aspects of pesticide use;*
- *administering permits, to ensure that adequate controls are placed on pesticides applied to public land and other specified uses;*
- *licencing and training of those who sell pesticides or apply them as a service, to ensure they comply with safety requirements;*
- *enforcement and monitoring, to ensure that the conditions of licences and permits are fulfilled, proper records are kept and pesticide residue levels in the environment are safe; and*
- *public information, to promote awareness of the dangers and proper management of pesticides.*

Program Highlights

A number of small amendments were made to the Pesticide Control Act Regulation this year. Several

products were added to, and several were removed from, the list of Exempted Schedule pesticides (i.e. those pesticides which are exempted from certification and licencing requirements because of their extremely low risk to health and environment).

There was also a change in the requirement for customers to sign a register when purchasing restricted or commercial pesticides. Under this amendment, vendors no longer have to obtain signatures from pesticide buyers, but they are still required to record their names and submit an annual summary to the Pesticide Control Program.

A working group chaired by the Pesticide Control Program Director was formed to submit proposals from British Columbia to the Registration Review Committee. This federal committee is investigating ways to improve the system for registering pesticides for use in Canada, particularly with regard to provincial and public involvement.

Work continued on a manual to help farmers train for pesticide applicator certification which, under legislation introduced in 1988, will be required as of January 1992. The manual is being produced by the Open Learning Agency with direction from the Pesticide Control Branch, the Ministry of Agriculture and Fisheries and the Federation of Agriculture. In addition, a video on safe pesticide practices was completed during the summer of 1989, for use with the manual.

Guidelines for pesticide treatment in public places were drafted during 1989/90. These dealt primarily with public notification and protection of sensitive areas, and were issued to structural and landscape pest control service companies in two regions. Feedback from licence holders is being used to refine these guidelines and determine their acceptance.

A working group was formed during the year to develop a code of good practice for pesticide use by farm workers.

Program Activities

Permits

Permits to apply pesticides are required in three circumstances:

- Pesticide Use Permits, for applications of non-exempted pesticides to public land or to private land used for forestry, transportation or public utilities;
- Special Use Permits, for non-registered applications of pesticides (such as experimental purposes); and
- Restricted Use Permits, for applications of permit-restricted pesticides.

Permit applications are reviewed by regional staff and by members of the Pesticide Control Committee, a group with representation from other ministries and from the federal government.

In 1989, there were 627 applications for Pesticide Use Permits, down 8 per cent from the year before. There were also 55 applications for Restricted Use Permits, and 69 applications for Special Use Permits.

Licensing and Training

Pesticide control staff are responsible for issuing annual licences to businesses that sell or apply pesticides. They also issue certificates to people who have obtained adequate training to sell or use pesticides.

This year, a total of 829 Pesticide Vendor Licences and 1,034 Pest Control Service Licences were issued.

During 1989, regional staff assisted with 92 pesticide training courses, many of which were conducted through community colleges. About 4,500 exams were written, resulting in just over 3,500 certificates being issued — a 15 per cent increase from the year before. About 60 percent of the certificates were issued to qualified applicators and 40 percent to qualified dispensers.

To assess the number of people who will require certification by the 1992 deadline, a study was initiated to review the number of individuals purchasing restricted pesticides in B.C.

Other training activities during the year included standardization of study kit materials, updating of examinations, and liaison with other provinces in developing national certification standards.

Enforcement

In 1989/90, private contractors conducted over 700 inspections of forestry permit sites and submitted data to the Ministry for analysis. Some of these inspections provided data for evaluating permit applications and others were to check that permit conditions were adhered to. In addition, Pesticide Control staff made nearly 250 inspections of permit sites and 2,500 inspections of pest control service and pesticide vendor facilities. These inspections were largely to examine storage facilities, records of pesticide sale and use, and staff certification.

Also this year, Ministry personnel investigated 263 incidents of potential pesticide misuse or environmental contamination. Allegations of such things as the poisoning of people, domestic animals, wildlife, birds and fish; spray drift damage to vegetation; and spills or fires involving pest control chemicals were all subject to Pesticide Control investigations.

As a result of these inspections and investigations, 11 licences were suspended or revoked. There were a total of 89 charges laid (including 87 tickets and two mandatory court appearances), $7,975 in fines levied, and numerous warnings issued for minor first infractions.

Monitoring

Water sampling to check levels of pesticide residues continued on 25 selected streams and rivers. Results showed that any residues present were well below the levels prescribed under provincial water quality objectives.

A food sampling project initiated in 1988 was continued this year, with a total of 493 analyses made of samples taken from 41 different crop types. Pesticide traces identified in 18 per cent of the samples were below the maximum residue limits set by Health and Welfare Canada, while one per cent of the samples were above maximum limits.

Enforcement and Outdoor Recreational Safety Program

Goal:
To promote compliance with environmental and outdoor recreation safety legislation.

Activities:

- *promoting compliance through public education and personal contact with hunters, anglers and other resource users;*
- *enforcing environmental legislation by identifying and investigating violations, apprehending violators, and warning, fining or prosecuting them; and*
- *responding to threats to human safety or property from wildlife.*

Program Highlights

The most important development in the area of enforcement this year was the addition of new Environmental Enforcement Units in all six of the ministry's administrative regions, enabling the ministry to undertake improved monitoring and inspection of industrial and municipal waste discharges.

Conservation Officers are responsible for the enforcement of 10 provincial and three federal statutes. During the year, they laid more than 3,600 charges under this legislation, resulting in excess of $500,000 in fines, and issued over 2,000 warnings. They also checked 31,286 hunters and 31,075 anglers.

Program Activities

Public Education

Conservation Officers attended or participated in over 1,100 meetings and speaking engagements during 1989/90, to promote compliance with environmental legislation through public education.

Public Protection

During the year, 10,554 problem wildlife complaints were received, with 2,861 requiring Conservation Officer response. Of all problem wildlife calls coming into the various regional offices around the province, 37 percent concerned black or grizzly bears.

Safety Administration

This year, 30 companies qualified for permits under the Commercial River Rafting Safety Act, introduced in 1988 following extensive consultation with the commercial river rafting industry. In addition, 94 guides successfully completed examinations for licencing under the Act, bringing the total to 368 since examinations were introduced.

This component of the Ministry also oversees boating restriction regulations in British Columbia under the *Canada Shipping Act*. These regulations restrict the types of boats and equipment allowed to operate where unsafe conditions exist.

A major part of this responsibility involves receiving and reviewing applications from local governments and organizations for additional restrictions. In 1989/90, seven new restrictions were approved, bringing to 255 the number of restricted sections of waterways in the province.

As the popularity of off-road vehicles has increased, so too has the need for new regulations and tighter controls over their use. In 1989/90, it became

increasingly clear that the scope of those regulations extended well beyond the resources of the Enforcement and Outdoor Recreational Safety Program. To deal with the situation, discussions were held this year, aimed at transferring responsibility for trail bikes, four wheel drives, dune buggies and other all-terrain vehicles to the Ministry of the Solicitor General (Motor Vehicle Branch).

Policy and Planning

In the period covered by this annual report, the Policy and Planning Branch of the Ministry of Environment included three sections:

- *Sustainable Development and Corporate Policy;*
- *Planning and Assessment; and*
- *Coastal Resources and Emergency Planning.*

Since that time, these sections have become separate branches of the Ministry.

Sustainable Development and Corporate Policy

In response to a growing need for long-range corporate strategic policy direction, the Ministry established the Sustainable Development and Corporate Policy Section (SDCP) in the summer of 1989.

SDCP is primarily responsible for providing:

- policies and strategies to achieve Ministry objectives;
- timely and effective support to the Ministry executive;
- leadership and coordination of the Ministry's legislative activities;
- support and coordination of Ministry intergovernmental activities;
- policy support and advice to Ministry programs and regional operations;
- leadership in the development of comprehensive "State of the Environment" reporting for the province;

- long-range strategic planning for the Ministry to facilitate a proactive approach to emerging issues; and
- fostering the concept of sustainable development within the provincial government.

During 1989/90, SDCP played an increasingly active role in coordinating the Ministry's intergovernmental activities, including the production of briefing and speaking notes for the Western Premiers' Conference, the Annual Premiers' Conference and First Ministers' Conferences.

In March 1990, when the Ministry assumed chairmanship of the Canadian Council of Ministers of the Environment, SDCP staff provided support to the Minister and Deputy Minister in their leadership roles.

SDCP also coordinated the provincial government's participation in the successful Globe '90 conference held in Vancouver and subsequently in consultations for the Globe '92 event.

In 1989/90, the SDCP provided policy support to the Minister and Ministry Executive by preparing speaking notes and briefing materials for use at Cabinet meetings, Cabinet Committee and Deputy Ministers' Committee meetings, as well as special hearings. These materials were also prepared for meetings of the British Columbia Round Table on the Environment and the Economy and the Clayoquot Sound Sustainable Development Task Force.

SDCP provided support and coordination services for the development of a comprehensive policy statement entitled "Environment 2001: An Environmental Action Plan for British Columbia", and initiated an extensive review of the Ministry's supporting legislation. Towards this end, staff worked with the Institute for Research on Public Policy on background studies to support the legislative renewal initiative, and assisted in a review of the roles and responsibilities of the Environmental Appeal Board.

Work was also started on British Columbia's first

comprehensive "State of the Environment Report" (due in 1991), and the branch hosted a national workshop on the subject.

Planning and Assessment

The Planning and Assessment Section was also established in the summer of 1989. Its purpose is to focus on issues for which Ministry policy must be developed and stated, or for which the views of several branches within the Ministry must be combined.

In 1989/90, B.C. Hydro initiated a new policy of diversifying electrical supply from independent power producers. This resulted in some 70 proposals for development of electrical generation capabilities using hydroelectric generation, coal or woodwaste thermal generation, or gas turbine facilities. Planning and Assessment helped structure the evaluation procedures for these projects and coordinated the Ministry's review.

This year, Planning and Assessment was involved in approximately 25 mining project reviews in its role as Ministry representative on the Mine Development Steering Committee. Strategies for the prevention and management of acid generation at mining sites continued to be a principal focus of Planning and Assessment efforts in the review process. Nearly half of the mining proposals concerned were located in northwestern British Columbia.

In addition, Planning and Assessment continued its work on the Reclamation Advisory Committee which reviews and approves reclamation permits prior to issuance by the Ministry of Energy, Mines and Petroleum Resources.

The Ministry has devoted considerable effort to the establishment of the Major Project Review Process. Formally introduced in February 1990, this process provides for the comprehensive assessment of technical, socio-economic and environmental impacts of projects in four main categories: pulp and paper production,

mineral smelting and refining, petrochemical production, and ports and marinas.

The first project to be subject to a Major Project Review was the proposed expansion of the Celgar Pulp Mill in Castlegar. At year-end, the evaluation process was well underway.

Planning and Assessment participated in a joint federal-provincial panel reviewing a the proposed ferrochromium smelter for Vancouver Island. Major areas under review were process technology, pollution control and chromium toxicity.

This group also worked toward the development of policy procedures to structure reviews of proposals for gas turbines and coal and wood waste thermal generation developments, including the setting of standards for emissions from such plants.

Other areas of policy development involved setting up protocols with the Ministry of Energy, Mines and Petroleum Resources in six fields important to mining: bonding, rock drains, acid mine drainage, reclamation, water storage structures and coarse coal reject use.

Planning and Assessment also participates in the task force set up by the Canadian Council of Ministers of the Environment to harmonize federal and provincial environmental review processes and development of related federal/provincial hearings.

Coastal Resources and Emergency Planning

The Coastal Resources and Emergency Planning Section was created in October 1989, to develop initiatives in coastal planning and coordinate provincial oil spill preparedness and response.

During the year, the section assumed leadership of the committee overseeing development of the Ministry's Corporate Geographic Information System. This computerized databank contains details on licences, permits, biological or physical attributes and other facts

relevant to Ministry operations for each geographic location of the province.

In addition, Coastal Resources staff were active in generating provincial agency interest in a Coastal Resource Strategy, as well as providing input for the creation of the Ministry's Environment 2001 action plan.

The section completed a review of the David Anderson Report to the Premier on Oil Transportation and Oil Spills and established an interagency review committee to provide a more thorough evaluation of the report for Cabinet.

The section also continued its work in support of the States/B.C. Task Force on Oil Spills, and chaired a committee on prevention alternatives which completed reports on oil transportation options and barge and vessel safety.

Support was also provided for the evaluation of damages resulting from the January 1989 *Nestucca* oil spill which fouled the beaches of southwest Vancouver Island. This included publication of a joint Ministry of Environment/Environment Canada report on the ecological impact of the spill, plus provision of evidence and support for a Provincial Court claim for damages against the company responsible.

In January 1990, work commenced on a number of other oil spill related projects. These included:

- an Oil Spill Response Atlas for the southwest coast of Vancouver Island, featuring a summary of environmental resources and sensitive shoreline along with details of appropriate oil spill countermeasures;
- an electronic Oil Spill Specialist Directory aimed at providing emergency response personnel with an instant access directory of oil spill experts familiar with the British Columbia environment; and
- a feasibility and requirements study to evaluate the potential development of an electronic Oil Spill Response Information System to support pre-spill planning, spill response and post-spill monitoring.

The section also coordinated the review of new technology proposals for oil spill cleanup. Among them were proposals for oil absorbency products and containment devices submitted by citizens and companies.

The Ministry participated in development of a federal-provincial agreement on mutual assistance in the event of environmental emergencies. This national accord calls for each province and the federal government to provide, upon request, equipment and staff to help deal with environmental emergencies occurring outside their usual jurisdiction.

Section personnel also represented the Ministry on the Provincial Interagency Emergency Preparedness Committee to assist in the coordination of information and activities related to environmental emergencies. A major part of this effort involved the ongoing formulation of a Provincial Earthquake Response Plan.

Public Affairs and Communications

Goal:

To provide services to the Ministry which strengthen its links to the public and develop understanding of and support for the Ministry's programs.

Activities:

- *planning communications for individual programs and the Ministry as a whole.*
- *supporting public consultation processes;*
- *providing environmental education programs and materials, and dealing on an individual basis with teachers and students;*
- *managing communications projects in both print and electronic media;*
- *using the media to inform the public promptly and accurately about Ministry initiatives, and responding to media inquiries about programs and issues;*
- *operating the Ministry library;*
- *managing and administering the Environment Youth Corps; and*
- *managing staff communications, including publication of the Ministry's internal newsletter,* Environment News.

Public Affairs and Communications

This was a transitional year for the Branch, as newly emerging issues and heightened public awareness of environmental concerns emphasized the need to reassess and strengthen the resources for delivery of communications planning and services on behalf of Ministry programs and initiatives. A major reorganization of the Branch was underway by the end of the fiscal year, to be completed during 1990/91.

A number of events during 1989, including the *Nestucca* and *Exxon Valdez* spills and the San Francisco earthquake, drew attention to the need for improved communications with the public not only during major oil spills, but for all types of environmental emergencies, in cooperation with the Ministry's regional staff and those of other agencies. The Branch worked closely with Coastal Resources and Emergency Planning staff on contingency planning for oil spills, provided public consultation services to the Premier's Advisor on Oil Spills and Tanker traffic, and provided communication support to the States/B.C. Task Force on Oil Spills.

Several major program-oriented communications projects were initiated during the year. These included:

- a program to promote wildlife viewing, carried out through the Wildlife Branch in conjunction with the ministries of Tourism and Parks;
- an information and education program for provincial trout hatcheries; and
- communications and educational activities to support the municipal solid waste strategy.

The Environment Youth Corps was launched early in the year in conjunction with the Ministry of Social Services and Housing. This program provides training and employment in environment-related projects to young people aged 16 to 24. By the end of June, projects employing over 1000 young people had been confirmed in about 50 communities. During the year, Youth Corps crews showed the value of their training by providing valuable cleanup assistance following oil spills at Sooke, Boundary Bay and Vancouver Harbour.

New publications issued during the year included a

brochure on household hazardous wastes, a series of brochures on fisheries and habitat concerns in the Lower Mainland with the theme "Catch the Spirit," and an overview of the Ministry's mission, principles, priorities and programs entitled "Meeting the Challenges".

Videos were produced to support the Environment Youth Corps, the Habitat Conservation Fund, Project Wild and the federal-provincial Floodplain Mapping Program.

The Ministry library continued to supply a wide range of information services to Ministry staff and the public. New database services were added to support technical information needs in the Ministry, and the library's on-line catalogue was made available to all Ministry staff with VAX user identification.

The Minister of Environment's 1990 Environmental Awards are made annually, and recognize outstanding achievement in working toward preserving and protecting British Columbia's environment. Those receiving awards in 1990 included two individuals (Mike Nicell of West Vancouver and Robert Harrington of Galena Bay); two environmental organizations (the Western Canada Wilderness Committee and the orphaned Wildlife Rehabilitation Society); a school (Wishart Elementary School in Victoria); the B.C. Medical Association; Canadian Helicopter Ltd. of Penticton; Pacific Brewers Distributors Ltd. of Burnaby; Sierra-Misco Environmental Ltd. of Victoria; and the Environment Youth Corps.

Environmental Appeal Board

The Environmental Appeal Board functions under the provisions of the Environment Management Act and hears appeals to decisions made under environmental legislation. The board, appointed by Cabinet, consists of one chairperson and a sufficient number of board members to expedite the process. In 1989 there were 23 board members including the Chairperson.

During the calendar year January-December 1989, 109 appellants filed 161 appeals against licences and permits, or Orders of the Director of Waste Management, the Director of Wildlife, the Comptroller of Water Rights and the Administrator of the Pesticide Control Act. These figures were up sharply from the previous year, during which 46 appellants filed a total of 63 appeals.

The Board, usually sitting in panels of three, conducted 47 hearings to accommodate these appeals. Several appellants appealed more than one permit and many dropped their appeals upon successful resolution of their concerns prior to the hearing date.

One application was made to the Supreme Court for a judicial review of a Board decision, and an application was made to the Lieutenant Governor in Council to vary or rescind a Board decision. At year-end, both of these applications were still under review.

There were 10 appeals adjourned on pesticide use permits in northern British Columbia to allow the permit holders and appellants to work out mutually acceptable forest management programs. In addition, two appeals on a special waste permit were postponed to allow the parties involved to resolve their differences.

Tables

REVENUE

WATER LICENCE FEES AND RENTALS

	Year Ending March 31, 1986	Year Ending March 31, 1987	Year Ending March 31, 1988	Year Ending March 31, 1989	Year Ending March 31, 1990
Application Fees	$ 138,320	$ 113,752	$ 219,265	$ 359,826	$ 277,873
Major Power	220,183,055	228,195,721	222,467,346	250,798,230	217,661,998
Local Authority	570,117	633,794	671,228	737,222	1,212,249
Other Rental	1,269,289	1,129,390	1,460,396	1,212,925	1,494,468
Penalty					79,145
TOTAL REVENUE	$ 222,160,781	$ 230,072,657	$ 225,827,235	$ 253,108,203	$ 220,725,733

Notes: – Application fees includes charges for new licences, amendments, approvals and services.

– Local authority revenue is that received from municipal and private water utilities supplying water for waterworks or irrigation purposes to their residents.

– Other rental includes charges for industrial, mining, domestic, storage, residential power, and other purposes and for permits to occupy Crown land.

– Penalties applied to overdue accounts commencing in 1989.

– Revision of tariff was approved July, 1987.

Number of Active Water Licences:

As of March 31, 1986	37,487	As of March 31, 1989	38,540
1987	37,963	1990	39,227
1988	38,162		

RECENT B.C. FRESHWATER ANGLING LICENCE SALES

	1986/87	1987/88	1988/89	1989/90
B.C. RESIDENTS				
Annual (age 16 - 64)	246,941	256,959	257,454	261,213
Annual (age 65+)	34,104	37,144	36,791	38,498
6-day	9,683	11,949	13,730	14,339
SUB-TOTAL	290,728	306,052	307,975	314,050
OTHER CANADIANS				
Annual	21,389	20,011	19,901	21,446
6-day	22,259	24,064	25,165	23,712
SUB-TOTAL	43,648	44,075	45,066	45,158
NON CANADIANS				
Annual	13,647	14,353	14,592	15,019
6-day	26,748	26,343	27,779	27,260
SUB-TOTAL	40,395	40,696	42,371	42,279
TOTAL ANGLERS	375,288	390,823	395,412	401,487
STEELHEAD				
B.C. Residents	28,336	28,926	27,938	26,756
Other Canadians	2,105	1,479	1,459	1,149
Non Canadians	2,027	2,285	2,643	2,641
TOTAL LICENCES	32,468	32,690	32,040	30,546
DEAN R. SPECIAL				
B.C. Residents	—	301	179	228
Other Canadians	—	36	44	33
Non Canadians	—	330	355	382
TOTAL LICENCES	—	667	578	643
KOOTENAY RAINBOW:				
Resident Annual	—	2,375	2,163	2,132
Resident 6-day	—	659	507	106
Other Canadians annual	—	406	373	344
Other Canadians 6-day	—	—	—	239
Non Canadians annual	—	178	175	187
Non Canadians 6-day	—	—	—	347
TOTAL LICENCES	—	3,618	3,218	3,340
CHINOOK SALMON (TOTAL)	—	—	24,967	28,030
DUPLICATE LICENCE (ALL)	—	1,307	1,307	1,587
ANGLING GUIDE	233	232	255	278
ASSISTANT GUIDE	284	218	204	259
GROSS REVENUE $	3,717,248	4,119,031	4,772,043	6,063,078

RESIDENT HUNTING LICENCE SALES 1989/90

	FEE	NUMBER	VALUE
Hunting	**$16**	**113,916**	**$1,822,656**
Junior Hunting	2	2,219	4,438
Hunting - Senior Citizens	1	12,028	12,028
Black Bear	**8**	**18,556**	**148,448**
Caribou	20	1,306	26,120
Cougar	20	700	14,000
Deer (Mule)	**8**	**100,791**	**806,328**
Deer (White-tail)	8	30,787	246,296
Deer (Queen Charlotte Island)	8	3,517	28,136
Elk	**20**	**19,593**	**391,860**
Grizzly Bear	70	1,212	84,840
Moose	20	49,372	987,440
Mountain Goat	**30**	**2,118**	**63,540**
Mountain Sheep	50	2,346	117,300
L.E.H. Applications	3	118,635	355,905
Total Resident Hunting		**477,096**	**$5,109,335**

NON-RESIDENT HUNTING LICENCE SALES 1989/90

	FEE	NUMBER	VALUE
N-R. Canadian	$16	795	$12,720
N-R. Junior Canadian	2	4	8
N-R. Alien	**115**	**4,836**	**556,140**
N-R. Junior Canadian	2	1	2
N-R. Small Game Only	50	377	18,850
Black Bear	**50**	**3,169**	**158,450**
Caribou	120	591	70,920
Cougar	120	70	8,400
Deer (Mule)	**60**	**1,544**	**92,640**
Deer (White-tail)	60	384	23,040
Deer (Queen Charlotte Island)	60	18	1,080
Elk	**120**	**1,071**	**128,520**
Grizzly Bear	320	811	259,520
Moose	120	2,696	323,520
Mountain Goat	**130**	**845**	**109,850**
Mountain Sheep	300	444	133,200
Wolf	25	1,215	30,375
Total Non-Resident Hunting		**18,871**	**$1,927,235**

LIMITED ENTRY HUNTING DEMAND 1989/90

Species	Authorizations Available	Applications Received
Caribou	180	1,225
Elk	10,109	30,934
Grizzly Bear	72	877
Moose	8,457	38,143
Mountain Goat	2,443	8,708
Mountain Sheep	638	6,348
Mule Deer	7,893	20,377
White-tailed Deer	3,989	14,912
Bearded Turkey	75	1,231
Total	33,856	122,755

BRITISH COLUMBIA WILD FUR HARVESTS 1984 - 1989

Number of Pelts by Fur Harvest Year

Species	1984/85	1985/86	1986/87	1987/88	1988/89
Beaver	13,297	13,668	19,513	13,974	6,718
Muskrat	14,841	10,693	13,088	15,373	6,320
Mink	3,183	2,832	3,311	4,971	3,127
Otter	673	650	654	641	361
Coyote	3,460	2,783	3,872	3,482	1,081
Fox	764	450	828	684	303
Wolf	232	156	201	126	79
Weasel	8,058	3,600	5,537	9,303	6,061
Wolverine	260	210	246	221	181
Skunk	23	55	15	6	1
Fisher	630	489	457	325	209
Marten	45,130	24,909	31,627	39,287	38,916
Lynx	1,668	1,206	1,050	1,113	1,243
Bobcat	271	134	238	288	144
Squirrel	31,663	29,573	26,535	23,215	14,850
Raccoon	978	1,337	757	798	345
Black Bear	364	343	421	423	106
Total Value ($Millions)	4.9	3.2	5.8	5.3	3.6

Year	Hunting Licence Sales	Deer	Moose	Elk	Goat	Sheep	Caribou	Grizzly Bear	Black Bear	Grouse	Ducks	Cougar
1980	167,879	36,079	12,486	1,996	421	198	138	180	5670	306,057	145,549	117
1981	174,088	35,190	10,752	1,811	396	263	127	225	3247	214,656	145,713	106
1982	154,143	34,774	10,906	2,532	408	183	150	185	3180	258,461	117,564	130
1983	144,669	29,804	9,613	3,321	581	218	145	201	3557	179,078	86,007	120
1984	136,930	32,673	9,196	4,183	576	192	150	195	3531	133,683	112,150	160
1985	130,236	27,337	10,214	3,344	480	216	159	178	3061	186,739	106,563	100
1986	128,600	29,077	12,076	3,170	603	312	141	190	3262	238,143	93,664	139
1987	126,838	32,429	11,957	2,499	567	329	180	173	2280	453,073	116,550	113
1988	126,473	36,605	12,210	3,757	588	458	195	206	3342	217,678	71,893	199
1989		35,550	12,342	3,035	643	462	186	177	2953	443,282	107,174	167

GUIDED HUNTER ACTIVITY IN THE 1989/90 HUNTING SEASON

Region	Number of Active Guide Outfitters	Number of Active Assitant Guides	Number of Guided Resident Hunters	Number of Guided Non-Res. Canadians	Number of Guided Non-Res. Aliens	Moose	Mountain Goat	Caribou	Deer	Mountain Sheep	Grizzly Bear	Black Bear	Elk	Cougar	Wolf	Upland Birds	Waterfowl	Other
1	7	27	2	1	156	0	1	0	7	0	4	165	6	5	1	0	0	0
2	5	7	0	0	24	0	0	0	1	0	0	16	0	0	0	0	0	0
3	12	28	0	1	116	6	14	0	11	7	0	62	0	2	0	0	0	0
4	36	293	2	38	919	23	117	2	104	11	17	147	206	8	1	13	2	2
5	65	144	14	6	757	193	32	8	98	9	16	82	0	6	10	37	1	1
6	62	210	10	34	890	339	184	105	12	78	46	185	0	0	16	88	0	2
7	94	379	29	45	1,543	744	161	76	25	207	66	260	106	0	26	138	30	7
8	11	38	4	6	183	1	6	0	39	14	1	84	3	27	0	5	0	5
*Prov. Totals	267	1062	61	130	4,499	1,306	515	191	297	326	150	1,001	321	48	54	281	33	17

Provincial total, big game animals killed by guided hunters: 4,226

* Some guides and some hunters were active in more than one region, hence the sum of the regional figures in some guide and hunter categories exceeds the number given for the province.

SUMMARY OF PESTICIDE CONTROL PROGRAM ACTIVITIES BY REGIONS
1989 / 90 FISCAL YEAR

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	TOTAL
LICENSING:							
Vendor licences issued	220	360	93	45	87	24	829
Service licences issued	279	426	150	50	108	21	1,034
PERMITS:							
Pesticide use applications	57	100	119	37	220	94	627
Special use applications	18	16	13	2	15	5	69
Restricted use applications	10	42	2		1		55
TRAINING AND CERTIFICATION:							
Pesticide applicator and dispenser course	31	41		5	12	3	92
Study kits issued	900	1,603	730	185	504	77	3,999
Examinations written (Course and home study)	901	1,665	900	150	850	75	4,541
Certificates issued	721	1,367	671	97	600	54	3,510
Failures	180	298	175	43	250	10	956
COMPLIANCE:							
Vendor and applicator inspections	171	1,838	110	72	181	55	2,427
Permit inspections	238	113	97	92	337	74	951
Licences suspended / revoked				11			11
Permits suspended / revoked							
Tickets issued	12	55	13		1	6	87
Other charges		2					2
Warnings	27	7	42	5	2	8	91
INVESTIGATIONS:							
Pesticide accident / misuse investigation	80	98	60	6	17	2	263

Notes: – Data is presented for the six Ministry regional offices which handle Pesticide Control Program functions:

Region 1 - Vancouver Island and Central Coast
Region 2 - Lower Mainland
Region 3 - Okanagan and Thompson-Nicola areas
Region 4 - Kootenays
Region 5 - Northern Interior, including Prince George, Peace River and Cariboo areas
Region 6 - Skeena, including Queen Charlotte Islands

– Permit inspections include inspections by contract inspectors